



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/897,900	07/05/2001	Hiroshi Murakami	03327.2260	1417

22852 7590 05/06/2003

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER
LLP
1300 I STREET, NW
WASHINGTON, DC 20005

EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 05/06/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/897,900

Applicant(s)

MURAKAMI, HIROSHI

Examiner

Luz L. Alejandro

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Storer et al., U.S. Patent 5,518,597.

Storer et al. shows the invention as claimed including a vacuum arc evaporation source comprising: a plurality of cathodes in a series of thin rings which are separated by spacers (see col. 9, lines 51-65) that can be, for example, an insulator such as boron nitride (see col. 17-line 66 to col. 18-line 17), the cathodes and insulating layers arranged in alternating layers, and wherein said plurality of cathodes are evaporated by vacuum arc discharge.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over in view of Storer et al., U.S. Patent 5,518,597 in view of Welty, U.S. Patent 5,480,527.

Art Unit: 1763

Storer et al. is applied as above and discloses using any metal material (see col. 9, lines 60-65) but fails to expressly disclose using a carbon as a cathode material. Welty discloses using a carbon cathode (see col. 9-lines 14-15). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Storer et al. so as to include a carbon cathode because Welty shows carbon to be a material commonly used as a cathode in an arc discharge apparatus.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Storer et al., U.S. Patent 5,518,597.

Storer et al. is applied as above but fails to expressly disclose wherein each of the cathodes has a switch for alternatively changing over the arc discharge power of said arc power supply toward said plurality of cathodes of said vacuum arc evaporation source. Storer et al., in col. 9-lines 40-50, discloses that various electrical configuration can be used to connect the cathodes to power supply(s), the cathodes can be connected to two different power supplies or to a single power supply, and the power can be supplied simultaneously or non-simultaneously by pulsing. Therefore, in view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Storer et al. so as to include a controller (switch) capable of switching the power supply among the cathodes so that a particular cathode or all the cathodes can be ignited at a desired (specific) time because

this would reduce the extra processing time required for the cathodes to be operated individually by an operator.

Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Welty, U.S. Patent 5,480,527 in view of Storer et al., U.S. Patent 5,518,597.

Welty shows the invention substantially as claimed including a film formation apparatus for forming films on a surface of a substrate (see fig. 2), the apparatus comprising: a vacuum arc evaporation source having a cathode 30, wherein said cathode is evaporated by vacuum arc discharge to thereby generate plasma having a cathode material on the surface of the cathode; and a magnetic coil (46,50) for generating a magnetic field to curve plasma generated by said vacuum arc evaporation source so as to remove coarse particles from the plasma and introduce the plasma, the coarse particles of which is removed, into a vicinity of the substrate 44 (see fig. 2 and col. 9-line 10 – col. 10-line 6).

Welty fails to expressly disclose a plurality of cathodes including different kinds of materials being insulated electrically from one another. Storer et al. discloses a plurality of cathodes in a series of thin rings which are separated by spacers (see col. 9-lines 51-65) that can be, for example, an insulator such as boron nitride (see col. 17-line 66 to col. 18-line 17), the cathodes and insulating layers arranged in alternating layers, and wherein said plurality of cathodes are evaporated by vacuum arc discharge. In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Welty so as to include the multiple

Art Unit: 1763

cathode configuration of Storer et al. because this would allow for forming different layers of different composition which would allow more flexibility of processing within the apparatus.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Storer et al., U.S. Patent 5,518,597 as applied to claim 5 above, and further in view of Murakami et al., EP 0 725 424 A1.

Storer et al. is applied as above but fails to expressly disclose a magnet disposed adjacent to the other surface of the cathode opposite to the surface on which the plasma is generated, for controlling a motion of an arc point of the vacuum arc discharge. Murakami et al. discloses a magnet 18 disposed adjacent to the other surface of the cathode 12 opposite to the surface on which the plasma is generated (see fig. 1 and col. 4-lines 13-58). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Storer et al. so as to include the magnet of Murakami et al. because this allows for controllability of the arc discharge (see col. 4-lines 54-58).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Welty, U.S. Patent 5,480,527 in view of Storer et al., U.S. Patent 5,518,597 as applied to claims 6-9 above, and further in view of Murakami et al., EP 0 725 424 A1.

Welty and Storer et al. are applied as above but fail to expressly disclose a magnet disposed adjacent to the other surface of the cathode opposite to the surface on

Art Unit: 1763

which the plasma is generated, for controlling a motion of an arc point of the vacuum arc discharge. Murakami et al. discloses a magnet 18 disposed adjacent to the other surface of the cathode 12 opposite to the surface on which the plasma is generated (see fig. 1 and col. 4-lines 13-58). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Welty modified by Storer et al. so as to include the magnet of Murakami et al. because this allows for controllability of the arc discharge (see col. 4-lines 54-58).

Response to Arguments

Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 1763

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Luz L. Alejandro
Primary Examiner
Art Unit 1763

April 29, 2003